

The lead sulfate ( $\text{PbSO}_4$ ) deposited on the surface of the positive electrode 18 or negative electrode 20 is reduced owing to the flow of the pulsating direct current from the positive electrode 18 toward the negative electrode 20 in the sulfation removing step 34, while at the same time the positive electrode 18 of the lead-acid storage battery 10 is activated through the electrochemical doping in which the carbon suspension obtained by the electrolytic oxidation of the carbon positive electrode is used as at least a part of the battery electrolyte of the lead-acid storage battery 10 in the electrode activating step 40. Therefore, it is possible to select, as recyclable batteries, a wider range of used lead-acid storage batteries, so that even an used lead-acid storage battery which has a battery electrolyte whose specific gravity is considerably lowered and which accordingly appears to suffer from the sulfation can be recovered to have substantially the same capacity as that of a new lead-acid storage battery. Thus, the invention permits a wider range of the used lead-acid storage batteries to be recycled.